CLAIMS

I/We Claim:

1. A rotor assembly for an alternator comprising:

an electrical wire defining an excitation winding;

a first pole piece having a generally circular body defining an axis of rotation and an outer radial periphery;

a plurality of pole fingers spaced radially about and extending axially from said outer radial periphery parallel to said axis of rotation;

a plurality of permanent magnets positioned on said outer radial periphery;

a plurality of covers, each of said covers being adapted to substantially encase one of said permanent magnets and to be mounted to said outer radial periphery of said first pole piece to secure said permanent magnet to said first pole piece.

2. The rotor assembly of claim 1 further comprising:

a second pole piece having a generally circular body defining a center, and axis of rotation and an outer radial periphery, said axis of rotation of said second pole piece being coaxial with said axis of rotation of said first pole piece;

a plurality of pole fingers spaced radially about said outer radial periphery of said second pole piece and extending axially from said outer radial periphery parallel to said axis of rotation;

a plurality of permanent magnets positioned on said outer radial periphery of said second pole piece;

a plurality of covers, each of said covers being adapted to substantially encase one of said permanent magnets and to be mounted to said outer radial

periphery of said second pole piece to secure said permanent magnet to said second pole piece.

3. The rotor assembly of claim 2 wherein said first and second pole pieces each include a plurality of mounting surfaces spaced radially about said outer radial periphery between said pole fingers, wherein one of said plurality of permanent magnets is positioned on each of said mounting surfaces.

4. The rotor assembly of claim 3 wherein each of said covers includes tabs extending therefrom and said mounting surfaces are adapted to engage said tabs to secure said covers, with said permanent magnets substantially encased therein, to said first and second pole pieces.

5. The rotor assembly of claim 4 wherein said mounting surfaces include ribs adapted to engage said tabs to secure said covers, with said permanent magnets substantially encased therein, to said first and second pole pieces.

6. The rotor assembly of claim 5 wherein said ribs are adapted to be staked over said tabs to secure said covers to said mounting surfaces.

7. The rotor assembly of claim 4 wherein each of said pole fingers of said first pole piece includes a distal end and extends between said pole fingers of said second pole piece, said distal ends being positioned over said mounting surfaces of said second pole piece and adapted to engage said covers to further secure said permanent magnets onto said mounting surfaces.

8. The rotor assembly of claim 4 wherein each of said pole fingers of said second pole piece includes a distal end and extends between said pole fingers of said first pole piece, said distal ends being positioned over said mounting surfaces of said first pole piece and adapted to engage said covers to further secure said permanent magnets onto said mounting surfaces.

9. The rotor assembly of claim 2 wherein said permanent magnets are secured within said covers with an adhesive.

10. The rotor assembly of claim 2 wherein said permanent magnets are sized such that when said permanent magnets are inserted within said covers, there is an interference fit between said cover and said permanent magnet such that said permanent magnet is frictionally held within said cover.

11. The rotor assembly of claim 2 wherein said covers are made from a non-magnetic material.

12. A rotor assembly for an alternator comprising:

an electrical wire defining an excitation winding;

a first pole piece and a second pole piece, each having a generally circular body defining a center, an axis of rotation and an outer radial periphery;

a plurality of pole fingers spaced radially about and extending axially from said outer radial periphery of said first and second pole pieces parallel to said axis of rotation;

a plurality of mounting surfaces spaced radially about said outer radial periphery of said first and second pole pieces in between said pole fingers;

a plurality of permanent magnets positioned on said mounting surfaces of each of said first and second pole pieces;

a plurality of covers, each of said covers having tabs extending therefrom and being adapted to substantially encase one of said permanent magnets, said mounting surfaces of said first and second pole pieces adapted to engage said tabs to secure said covers, with said permanent magnets substantially encased therein, to said mounting surfaces.

13. The rotor assembly of claim 12 wherein each of said pole fingers of said first pole piece includes a distal end and extends between said pole fingers of said second pole piece, said distal ends being positioned over said mounting surfaces of said second pole piece and adapted to engage said covers to further secure said permanent magnets onto said mounting surfaces.

14. The rotor assembly of claim 12 wherein each of said pole fingers of said second pole piece includes a distal end and extends between said pole fingers

of said first pole piece, said distal ends being positioned over said mounting surfaces of said first pole piece and adapted to engage said covers to further secure said permanent magnets onto said mounting surfaces.

15. The rotor assembly of claim 12 wherein said permanent magnets are secured within said covers with an adhesive.

16. The rotor assembly of claim 12 wherein said permanent magnets are sized such that when said permanent magnets are inserted within said covers, there is an interference fit between said cover and said permanent magnet such that said permanent magnet is frictionally held within said cover.

17. The rotor assembly of claim 12 wherein said covers are made from a non-magnetic material.

18. A method of attaching permanent magnets to the outer radial periphery of a rotor assembly for an alternator comprising:

providing a rotor assembly having an electrical wire defining an excitation winding, a first pole piece and a second pole piece, each of the first and second pole pieces having a generally circular body defining a center, an axis of rotation and an outer radial periphery with a plurality of pole fingers spaced radially about and extending axially from the outer radial periphery parallel to the axis of rotation and a plurality of mounting surfaces spaced radially around said outer radial periphery between said pole fingers;

providing a plurality of permanent magnets;

providing a plurality of covers, each adapted to substantially encase one of the permanent magnets;

placing each one of the permanent magnets within a cover;

mounting the covers, with the permanent magnets encased therein, to the mounting surfaces of the first and second pole pieces.

19. The method of claim 18 wherein each of the covers includes tabs extending therefrom and the mounting surfaces of the first and second pole pieces are adapted to engage the tabs, and mounting the covers, with the permanent magnets encased therein, to the outer radial periphery of the first and second pole pieces includes:

placing the covers, with the permanent magnets encased therein to the outer radial periphery of the first and second pole pieces;

engaging the mounting surfaces with the tabs of the covers to secure the covers, with the permanent magnets encased therein, to the first and second pole pieces.

20. The method of claim 18 wherein engaging the mounting surfaces with the tabs of the cover includes staking portions of the mounting surface over onto the tabs to secure the covers to the mounting surfaces.

21. The method of claim 18 wherein the mounting surfaces include ribs formed thereon and engaging the mounting surfaces with the tabs of the covers includes staking the ribs over the tabs to secure the covers to the mounting surfaces.

22. The method of claim 18 wherein each of the pole fingers of the first pole piece includes a distal end and extends between the pole fingers of the second pole piece, the distal ends being positioned over the mounting surfaces of the second pole piece and adapted to engage the covers to further secure the permanent magnets onto the mounting surfaces and each of the pole fingers of the second pole piece includes a distal end and extends between the pole fingers of the first pole piece, the distal ends being positioned over the mounting surfaces of the first pole piece and adapted to engage the covers to further secure the permanent magnets onto the mounting surfaces, said method including:

assembling the first and second pole pieces relative to one another such that the distal ends of the pole fingers engage the covers to secure the permanent magnets to the first and second pole pieces.

23. The method of claim 18 wherein placing the permanent magnets within the covers includes securing the permanent magnets within the covers with an adhesive.

24. The rotor assembly of claim 18 wherein the permanent magnets are sized such that when the permanent magnets are inserted within the covers, there is an interference fit between the cover and the permanent magnet, and placing the permanent magnets within the covers includes press fitting the permanent magnets into the covers such that the permanent magnets are frictionally held within the covers.